APPENDIX A

PERMITTING AND AGENCY CORRESPONDENCE

TABLE A-1 PERMITS AND APPROVALS FOR RWRP FACILITY EXPANSION		
Unit of Government	**Type of Application**	**Status**
MPCA	NPDES General Permit for discharge of stormwater during construction activities, for construction that will disturb more than one acre of non-impervious surface	To be applied for
MPCA	Plans and Specifications Review for Construction	To be obtained
MPCA	Section 401 Water Quality Certification of USACE Section 404 Permit	To be obtained (MPCA has waived authority)
DNR	General permit for temporary dewatering; permit for work in public waters to relocate the drainage way; identification of state-listed Threatened, Endangered, and Special Concern Species	To be applied for if groundwater dewatering during construction will exceed 10,000 gpd or 1 million gallons per year; to be applied for; completed
U.S. Fish and Wildlife Service	Identification of federal-listed Threatened and Endangered Species	Will coordinate as required
USACE	Section 404 Permit for dredging and filling of navigable waters/jurisdictional wetlands	To be applied for if absence of wetlands is not verified in spring 2004
State Historic Preservation Office (SHPO)	Concurrence on Findings of Cultural Resource Impacts	To be obtained
Rochester-Olmsted Planning Department	Certificate of Wetland Conservation Act Exemption/ or Permit Application	To be applied for if absence of wetlands is not verified in spring 2004.
Rochester-Olmsted Planning Department	Conditional Use Permit for work in Shoreland and Floodplain Districts and for significant land alterations (SLA)	To be applied for if the Sludge Storage Tanks are within these Districts; to be obtained if grading activities exceed SLA threshold
City of Rochester	Grading, Drainage, and Erosion Control Plan approval and Grading Permit	To be obtained
City of Rochester	Sewer Utility Retained Earnings	To be acquired

TABLE A-2

PERMITS AND APPROVALS FOR TRUNK SEWER EXTENSIONS

Unit of Government	Type of Application	Status
USACE	Section 10 Permit for activities affecting navigable waters of the U.S.	To be applied for
USACE	Section 404 Permit for dredging and filling of navigable waters/jurisdictional wetlands	To be applied for
U.S. Fish and Wildlife Service	Identification of federal-listed Threatened and Endangered Species	Will coordinate as required
MPCA	Section 401 Water Quality Certification of USACE Section 404 Permit	To be obtained (MPCA has waived authority)
MPCA	Sewer Extension Permit	To be obtained
MPCA	NPDES General Permit for discharge of stormwater during construction activities, for construction that will disturb more than one acre of non-impervious surface	To be applied for
MPCA	Plans and Specifications Review for Construction	To be obtained
DNR	Public Waters Work Permit	To be applied for
DNR	General permit for temporary dewatering	To be applied for if groundwater dewatering during construction will exceed 10,000 gallons per day or 1 million gallons per year
MnDNR	Identification of state-listed Threatened, Endangered, and Special Concern Species	Will coordinate as required
MnDNR	Utility Crossing License	To be applied for
SHPO	Concurrence on Findings of Cultural Resource Impacts	To be obtained
Minnesota Department of Transportation (MnDOT)	Utility Permit on Trunk Highway Right of Way (Form 2525).	To be applied for
Rochester-Olmsted Planning Department	Certificate of Wetland Conservation Act Exemption/ or Permit Application	To be applied for
City of Rochester	Conditional Use Permit for work in Shoreland Districts	To be applied for
City of Rochester	Sewer Utility Retained Earnings	To be acquired
City of Rochester	Sewer Utility Revenue Bonds	To be acquired

TABLE A-3 PERMITS AND APPROVALS RELATED TO SECONDARY DEVELOPMENT		
Unit of Government	**Type of Application**	**Regulatory Citation**
USACE	Clean Water Act Section 404/10 Wetland Permits	Section 404 of The Clean Water Act Title 33CFR26 - Water Pollution Prevention and Control Sub. Ch. IV - Permits and Licenses
Minnesota Department of Health (MDH)	Water Main Plan Review	Minn. R. Ch. 4720
	Water Well Installation and Well Abandonment Permits	Minn. Stat. Ch. 103I and Minn. R. Ch. 4725
U.S. Fish and Wildlife Service	U.S. Fish and Wildlife Service Coordination	Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988;
DNR	Protected Waters Permits	Minn. Stat. Ch. 103G, subd. 15
	Water Appropriations/Dewatering Permits	Minn. Stat. Ch. 103G.26
	Utility Crossing Licenses	Minn. Stat. Ch. 103G, Minn. R. Ch. 6115.0810
	Shoreland Management	Minn. R. chs. 6120.5000 - 6120.6200
	Natural Heritage Program Coordination	Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988; Minn. Stat. Ch. 84.0895; Minn. R. Ch. 6134
MnDOT	State Highway Access Permits	Minn. Stat. Ch. 505 Minn. R. Ch. 8810
MPCA	Air Emission Facility Permits	Minn. R. Ch. 7007
	Indirect Source Permits	Repealed
	Section 401 Water Quality Certificates	Minn. R. Ch. 7001.1420 (Authority Waived)
	NPDES Construction Permits (stormwater)	Minn. Stat. Ch. 115, Minn. R. Ch. 7002
	Sanitary Sewer Extension Permits	Minn. Stat. Ch. 155.07, subd. 3
	Individual Sewage Treatment System Permit	Minn. R. Ch. 7080.0310
	Wastewater Permits	Minn. R. Ch. 7077
	Demolition Permits	Minn. R. Ch. 7035
	Spill Prevention Control and Countermeasure Plans	Minn. R. Ch. 7150.0200
	Tank Registration\Licensing	Minn. R. Ch. 7150.0300

TABLE A-3

PERMITS AND APPROVALS RELATED TO SECONDARY DEVELOPMENT

Unit of Government	Type of Application	Regulatory Citation
SHPO	Cultural Resource Coordination	Section 106 of the Historic Preservation Act, Protection of Historic Properties" (36 CFR Part 800), Minn. Stat. chs. 138.31-.42, Minnesota Private Cemeteries Act- Minn. Stat. Ch. 307.08
Soil and Water Conservation District	MN Wetlands Conservation Act Permits (Administered for Olmsted County)	Minn. Stat. Chs. 103G.222-.2373, Minn. R. Ch. 8420
Townships/Villages/ County	Culverts and Roadway Access	Varies by jurisdiction
	Right-of-Way and Easements	Varies by jurisdiction
LOCAL - ENVIRONMENTAL* City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Erosion Control & Surface Water Run-off Permits	Chapter 64, *City of Rochester Code of Ordinances*.
		Section 10.20, *Olmsted County Zoning Ordinance.*
	Floodplain Review	Section 62.800, *City of Rochester Code of Ordinances.*
		Article IX, *Olmsted County Zoning Ordinance.*
	Individual Sewage Treatment System Permits	MN Rules Ch. 7080 and Olmsted County Public Health Regulation Number 41.
	Private Water Supply (well) Permits	Minn. Stat. Ch. 103I and Minn. R. Ch. 4725.3850, and Olmsted County Water Well/Water Supply Ordinance.
	Shoreland Review	Section 62.1000, *City of Rochester Code of Ordinances.*
		Section 9.10, *Olmsted County Zoning Ordinance.*
	Solid Waste Management	*Olmsted County Solid Waste Management Ordinance #10.*
	Erosion Control & Grading Permits (stormwater)	Chapter 64, *City of Rochester Code of Ordinances.*
	Floodplain Review	Section 62.800, *City of Rochester Code of Ordinances.*
	MN Wetland Conservation Act Permits	Minn. R. Ch. 8420.
	Park Dedication	Section 64.400, *City of Rochester Code of Ordinances.*
	Substantial Land Alteration & Mining Permits (for excavation and/or filling)	Section 62.1100, *City of Rochester Code of Ordinances.*
	Water and Sewer Connection Permits	Rochester Public Works.
	Wellhead Protection Area DWSMAs	Minnesota Department of Health, Rochester Public Utilities.

TABLE A-3 PERMITS AND APPROVALS RELATED TO SECONDARY DEVELOPMENT		
Unit of Government	**Type of Application**	**Regulatory Citation**
LOCAL - DEVELOPMENT* City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Agricultural Setback Permits	Section 3.06, *Olmsted County Zoning Ordinance.*
	Building Permits	*Uniform Building Code.*
	Conditional Use Permits	Section 61.140, *City of Rochester Code of Ordinances*.
		Section 4.02, *Olmsted County Zoning Ordinance.*
	Construction Plans	*Uniform Building Code.*
	Design Modification Permits	Section 60.420, *City of Rochester Code of Ordinances.*
		Not applicable outside Orderly Annexation Areas (OAAs).
	Development Agreements	Section 61.250, *City of Rochester Code of Ordinances*.
		Chapter Five, *Olmsted County General Land Use Plan.*
	General Development Plans	Section 61.210*, City of Rochester Code of Ordinances*.
		Section 4.0 G, *Olmsted County Zoning Ordinance*.
	Home Occupation Permits	Section 62.278 *City of Rochester Code of Ordinances*.
		Section 10.02, *Olmsted County Zoning Ordinance*.
	Incentive Development Approvals	Section 62.600, *City of Rochester Code of Ordinances*.
		Not applicable outside OAA.
	Interim Development Agreements	Chapter Five, *Olmsted County Future Land Use Plan.*
	Land Use Plan Amendments	Chapter V, *Rochester Urban Service Area Land Use Plan* (inside Urban Service/Urban Reserve Area).
		Chapter Six, *Olmsted County General Land Use Plan* elsewhere.
	Land Subdivision Permit (Preliminary Plat and Metes/Bounds Approvals)	Section 61.220, *City of Rochester Code of Ordinances*.
		Subdivision Ordinance for Olmsted County.
	Land Subdivision Final Plat Approvals	Section 61.220, *City of Rochester Code of Ordinances*.
		Subdivision Ordinance for Olmsted County.

TABLE A-3

PERMITS AND APPROVALS RELATED TO SECONDARY DEVELOPMENT

Unit of Government	Type of Application	Regulatory Citation
LOCAL - DEVELOPMENT* City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Mobile Home Installation Permits	*Section 10.42, Olmsted County Zoning Ordinance*
	Moving Permits	Section 108, *City of Rochester Code of Ordinances*.
	Performance Residential Permits	Chapter 62, *City of Rochester Code of Ordinances*.
		Not applicable outside OAA.
	Rezoning Approvals	Section 60.330, *City of Rochester Code of Ordinances.*
		Section 4.00, *Olmsted County Zoning Ordinance*.
	Right-of-Way and Easements	Done by Township or City/County Public Works Departments (road authority). City authority is found in Chapter XVII, *Home Rule Charter of the City of Rochester, Minnesota.*
	Roadway Access Permits	Varies by roadway authority.
	Roadway Improvement Permits	Varies by roadway authority.
	Sign Permits	Section 63.220, *City of Rochester Code of Ordinances*.
		Section 10.46, *Olmsted County Zoning Ordinance*.
	Site Development Plans	Section 61.580, *City of Rochester Code of Ordinances*.
		Not applicable outside OAA.
	Subdivision Variances	Section 60.410, *City of Rochester Code of Ordinances*.
		Article IX, *Subdivision Ordinance for Olmsted County*.
	Temporary Use Permits	Section 61.115, *City of Rochester Code of Ordinances*.
		Section 4.10, *Olmsted County Zoning Ordinance.*
	Traffic Impact Studies	Section 61.520, *City of Rochester Code of Ordinances*.
		Not applicable outside OAA.
	Variances (general)	Section 60.410, *City of Rochester Code of Ordinances*.
		Section 4.08, *Olmsted County Zoning Ordinance*.
	Zoning Certificates	Section 61.110, *City of Rochester Code of Ordinances*.
		Section 3.06, *Olmsted County Zoning Ordinance*.

TABLE A-3

PERMITS AND APPROVALS RELATED TO SECONDARY DEVELOPMENT

Unit of Government	Type of Application	Regulatory Citation
LOCAL - DEVELOPMENT*	Demolition Permits	Varies by authority
	Subdivision (Plat) Approval	Section 61.220, *City of Rochester Code of Ordinances*
City of Rochester or Olmsted County as depicted under the Regulatory Citation column.	Annexation	MN Ch. 414, Minnesota Statutes
	Housing Certificates for Rental Housing	In City of Rochester, Section 38.05 of the *Rochester Code of Ordinances* Section 61.120 (Does not apply to OAA if not in City).

* Properties within the 25-year USA that will not have municipal services available for more than 10 years can develop as an "interim development." This type of development will ensure that future connections and transitions to municipal jurisdiction will occur as smoothly as possible. Properties within the 50-year URA can also develop as an "interim development" as long as an Orderly Annexation Agreement has been reached between the township and municipality. County jurisdiction is only in areas within the County, but outside of the OAAs only for interim development within USAs/URAs. The City's jurisdiction includes OAAs currently outside of the City limits and newly annexed development in the USAs/URAs.

TABLE A-4

LIST OF POTENTIAL MAJOR INFRASTRUCTURE FINANCIAL ASSISTANCE SOURCES

INFRASTRUCTURE	PUBLIC INFRASTRUCTURE/FINANCIAL ASSISTANCE[1]
RWRP Facility Expansion	Sewer Utility Retained Earnings
	Sewer Utility Revenue Bonds
	State Revolving Loan Fund
	General Obligation Bonds
	Property Taxes
Trunk Sanitary Sewer Extensions	Sewer Utility Retained Earnings
	Sewer Utility Revenue Bonds
Roadway Extension/Modification	Federal TEA-21 funded through Federal Highway Administration and MnDOT
	County, City, and Township taxes
	County Road and CSAH funding if associated with county road system in Project Area
	MnDOT
	Local transportation improvement districts
	Stormwater management fees and charges
Parkland Acquisition	DNR state funding programs (See DNR financial assistance directory July 2001-July 2003)
	Land and Water Conservation Funds
	Property taxes
Municipal Water	PFA for State Drinking Water Revolving Loan Fund
Schools	School referendums, property taxes, and bonds
Emergency Service Providers	Property taxes (for fire and police only; ambulance service is private)
Stormwater Management Facilities	Storm Water Management Plan Area Charges and Stormwater Utility Fees
Electricity	Electric Utility Revenue Bonds and Retained Earnings.

[1] Note that these are potential funding sources identified at this time. Additional funding sources may be identified as development occurs in the EAW Project Area.

Minnesota Department of Natural Resources

Natural Heritage and Nongame Research Program, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-40__

Phone: (651) 296-7863 Fax: (651) 296-1811 E-mail: sarah.hoffmann@dnr.state.mn.us

November 3, 2003

Leslie H. Knapp
Earth Tech
3033 Campus Drive North, Suite 290
Minneapolis, MN 55441

Re: Request for Natural Heritage information for vicinity of proposed Rochester Water Reclamation Plant Expansion – Trunk Sewer Extension
NHNRP Contact #: ERDB 20040267

County	Township (N)	Range (W)	Sections
Olmsted	107	13	7-10,13-23,30
Olmsted	107	14	2-24
Olmsted	107	15	1,2,11-15,24
Olmsted	108	14	21,22,27-34
Olmsted	108	15	25,35,36

Dear Ms. Knapp,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are 57 known occurrences of rare species or natural communities in the area searched (for details, see enclosed database printout and explanation of selected fields). Following are specific comments for **only those elements that *may* be impacted** by the proposed project. Rare feature occurrences not listed below are not anticipated to be affected by the proposed project.

- An area identified by the Minnesota County Biological Survey as a "Site of High Biodiversity Significance" is located at the northern tip of the project area (see the enclosed map for details). "Sites of Biodiversity Significance" are areas with varying levels of native biodiversity that may contain high quality native plant communities, rare plants, rare animals, and/or animal aggregations. Biodiversity significance is evaluated on the basis of the number of rare species, the quality of the native plant communities, size of site, and context within the landscape. This particular site contains some of the best prairie habitat remaining in Olmsted County. The dry prairie remnants are in very good condition, have excellent species diversity, and support several rare plant species including Prairie Bush Clover (*Lespedeza leptostachya*), a federally and state listed threatened species, Tuberous Indian Plantain (*Arnoglossum plantagineum*), a threatened species, and Hill's Thistle (*Cirsium hillii*) and Rattlesnake-Master (*Eryngium yuccifolium*), both special concern species. Because more than 99% of the prairie that was present in the state before settlement has been destroyed, and more than one-third of Minnesota's endangered, threatened, and special concern species are now dependent on the remaining small fragments of Minnesota's prairie ecosystem, we feel that all prairie remnants merit protection. We recommend that in project development, alternatives be sought which will avoid impacts to this ecologically significant site. Please also note that since Prairie Bush Clover is on the list of federally threatened or endangered species, the prohibitions of the Endangered Species Act of 1973, as amended, may apply. Contact the U.S. Fish and Wildlife Service at 612-725-3548 for further information about the applicability of the federal Endangered Species Act to this proposed action.

- The Oronoco Prairie Scientific and Natural Area (SNA) is located at the northeastern tip of the project area (SW ¼ Sec. 22 T108N R14W). Scientific and Natural Areas are legally designated public nature preserves established to protect the state's rarest natural features and sensitive resources. This particular SNA contains several dry prairie natural communities which support Valerian (*Valeriana edulis* var. *ciliata*), a threatened species, and White Wild Indigo (*Baptisia alba*) and Rattlesnake-Master (*Eryngium yuccifolium*), both special concern species. Scientific and Natural Areas are given the highest level of protection and the utmost consideration in assessing potential impacts from nearby projects. It should be determined whether the project as proposed has the potential to impact the SNA, the rare features the SNA supports, or public use of the SNA. If so, avoidance and protection measures must be proposed.

- The western half of the Hadley Valley project area and the eastern tip of the Kings Run project area are within a potentially important area for Blanding's Turtles (*Emydoidea blandingii)*, a state threatened species. There are 13 such areas in the state, which are considered by the DNR to be priority areas for research and management activities, but for which important information on the size and health of the Blanding's turtle populations is lacking. Because of this lack of information, the exact boundaries of the potentially important areas have not yet been determined. However, due to the widespread development occurring state-wide on Blanding's turtle habitat, these areas are becoming increasingly indispensable for maintaining the species' security in the state. For your information, I have attached a fact sheet and a flyer about the Blanding's Turtle. The fact sheet is intended to provide you with background information regarding habitat use, life history, and reasons for the species' decline, as well as recommendations for avoiding and minimizing impacts to this rare turtle. As you will note, there are two lists of recommendations. The first list contains recommendations to prevent harm to turtles during construction work, and is relative to all areas inhabited by Blanding's Turtles. The second column expands on the first column, and contains greater protective measures to be considered for areas known to be of state-wide importance to Blanding's Turtles. Because your project is within one of these areas, please refer to both list of recommendations. The flyer, which should be given to all contractors working in the area, contains an illustration and description of the Blanding's Turtle, as well as a summary of the recommendations provided in the fact sheet.

- The South Fork of the Zumbro River flows along the border of the Hadley Valley and Kings Run project areas. Several rare mussel species including Elktoe (*Alasmidonta marginata*) mussels, a threatened species, and Fluted-Shell (*Lasmigona costata*) mussels, a special concern species, have been documented in this river. Freshwater mussels are declining nation-wide and have been described as one of North America's most imperiled groups of animals. In Minnesota, 25 of our 48 native mussel species are listed as either endangered, threatened, or of special concern. The primary reason behind the decline is the degradation of our lakes and rivers as a result of runoff and physical changes such as damming, channelization, and dredging. The Elktoe mussel has a very limited distribution and is in danger of extirpation in the Zumbro River and its tributaries. Mussels are particularly vulnerable to deterioration in water quality, especially increased siltation. As such, it is imperative that sound erosion and sediment control practices be implemented and maintained throughout the duration of the project.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Division of Ecological Services, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. Its purpose is to foster better understanding and protection of these features.

Because our information is not based on a comprehensive inventory, there may be rare or

otherwise significant natural features in the state that are not represented in the database. A county-by-county survey of rare natural features is now underway, and has been completed for Olmsted County. Our information about natural communities is, therefore, quite thorough for that county. However, because survey work for rare plants and animals is less exhaustive, and because there has not been an on-site survey of all areas of the county, ecologically significant features for which we have no records may exist on the project area.

The enclosed results of the database search are provided in two formats: index and full record. To control the release of locational information which might result in the damage or destruction of a rare element, both printout formats are copyrighted.

The index provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an Environmental Assessment Worksheet, municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index for any other purpose, please contact me to request written permission. Copyright notice for the index should include the following disclaimer:

> "Copyright (year) State of Minnesota, Department of Natural Resources. This index may be reprinted, unaltered, in Environmental Assessment Worksheets, municipal natural resource plans, and internal reports. For any other use, written permission is required."

The full-record printout includes more detailed locational information, and is for your personal use only. **If you wish to reprint the full-record printouts for any purpose, please contact me to request written permission.**

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on *rare natural features*. It does not constitute review or approval by the Department of Natural Resources as a whole. If you require further information on the environmental review process for other wildlife-related issues, you may contact your Regional Environmental Assessment Ecologist, Shannon Fisher, at (507) 359-6073.

An invoice for the work completed is enclosed. You are being billed for map and database search and staff scientist review. Please forward this invoice to your Accounts Payable Department. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

Sarah D. Hoffmann

Sarah D. Hoffmann
Endangered Species Environmental Review Coordinator

encl: Database search results
Rare Feature Database Print-Outs: An Explanation of Fields
Fact sheets: Blanding's Turtle
Natural Communities and Rare Species Map: Olmsted County
Invoice

cc: Shannon Fisher, DNR
Gary Wege, USFWS

Environmental Review Fact Sheet Series

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle

(Emydoidea blandingii)

Minnesota Status:	Threatened	State Rank[1]:	S2
Federal Status:	none	Global Rank[1]:	G4

HABITAT USE

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (cattails, water lilies, etc.) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding's turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade* and road kills during seasonal movements
- increase in predator populations (skunks, racoons, etc.) which prey on nests and young

*It is illegal to possess this threatened species.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	**List 2. *Additional* recommendations for areas known to be of state-wide importance to Blanding's turtles.**
GENERAL	
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road-crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETLANDS	
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid- afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROADS	
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROADS cont.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.
UTILITIES	
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).	
Below-ground utility construction sites should be returned to original grade (trenches can trap turtles).	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blandingís turtles).
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.
Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).

Protecting Blandingís Turtle Nests: Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is ***very important*** that the fencing be **removed before August 1st** so the young turtles can escape from the nest when they hatch!

REFERENCES

[1]Association for Biodiversity Information. íHeritage Status: Global, National, and Subnational Conservation Status Ranks.í NatureServe. Version 1.3 (9 April 2001). http://www.natureserve.org/ranking.htm (15 April 2001).

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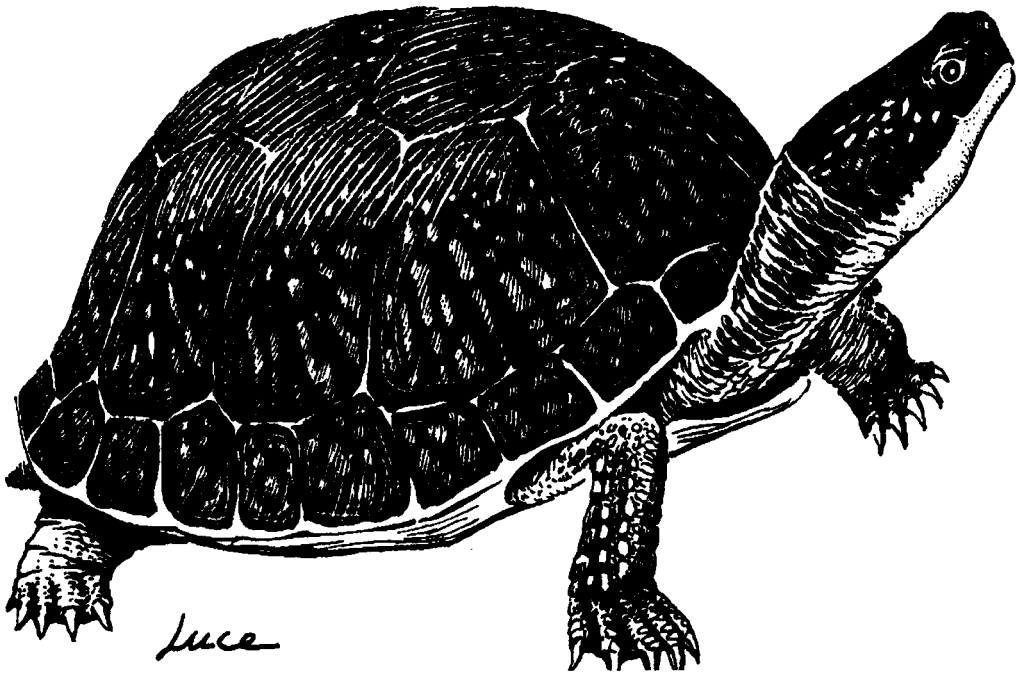
CAUTION



BLANDING'S TURTLES

MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are a State Threatened species and are protected under Minnesota Statute 84.095, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. For additional information on turtles, or to report a Blanding's turtle sighting, contact the DNR Nongame Specialist nearest you: Bemidji (218-755-2976); Brainerd (218-828-2228); New Ulm (507-359-6033); Rochester (507-280-5070); or St. Paul (651-297-2277).

DESCRIPTION: The Blanding's turtle is a medium to large turtle (5 to 10 inches) with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third, enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head, legs, and tail are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck.

Illustration by Don Luce, from Turtles in Minnesota, Natural History Leaflet No. 9, June 1989, James Ford Bell Museum of Natural History

SUMMARY OF RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS TO BLANDING'S TURTLE POPULATIONS

(see Environmental Review Fact Sheet Series for full recommendations)

- A flyer with an illustration of an adult Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.
- Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed to continue their travel among wetlands and/or nest sites.
- If a Blanding's turtle nests in your yard, do not disturb the nest, and do not allow pets near the nest.
- Blanding's turtles do not make good pets. It is illegal to keep this threatened species in captivity.
- Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.
- Small, vegetated temporary wetlands should not be dredged, deepened, or filled.
- All wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.
- Roads should be kept to minimum standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used, 4" high curbs at a 3:1 slope are preferred.
- Culverts under roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 in. diameter and flat-bottomed or elliptical.
- Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.
- Utility access and maintenance roads should be kept to a minimum.
- Below-ground utility construction sites should be returned to original grade.
- Terrain should be left with as much natural contour as possible.
- Graded areas should be revegetated with native grasses and forbs.
- Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).

Compiled by the Minnesota Department of Natural Resources Natural Heritage and Nongame Research Program, August, 2001
Endangered Species Environmental Review Coordinator, 500 Lafayette Rd., Box 25, St. Paul, MN 55155 / 651-296-7863

ERIGERON ACRIS L.

Asteraceae

Acrid Fleabane

OFFICIAL STATUS: Proposed Special Concern

Erigeron acris is a circumboreal species that ranges southward in mountainous regions and in other boreal habitats. It survives at the comparatively southern latitude of Minnesota because of the climate-modifying effect of Lake Superior, and its steep, rocky shoreline. This familiar pattern of occurrence is apparent in other arctic or boreal species such as *Empetrum atropurpureum* (purple crowberry), *Vaccinium uliginosum* (Alpine bilberry), and *Sagina nodosa* (knotty pearlwort). This unique association of northern disjunct and edge-of-range species is one of the most important and thoroughly studied botanical phenomena in Minnesota. *E. acris* was first recorded in Minnesota in 1929 at Susie Island (Cook County) in Lake Superior. In 1945 it was discovered at nearby Pigeon Point (Cook County) and at the more distant Cascade River (Cook County). None of these populations have been relocated since the dates of their original discoveries, so current site-specific information is not available. **HABITAT**: *E. acris* occurs in rock crevices on the shore of Lake Superior and possibly on steep cliffs and talus facing the lake. **REFERENCES**: Given, D. R., and J. H. Soper. 1981. The arctic-alpine element of the vascular flora at Lake Superior. National Museums of Canada. Publications in Botany 1. Ottawa. 70pp.

ERYNGIUM YUCCIFOLIUM Michx.

Apiaceae

Rattlesnake-master

OFFICIAL STATUS: Special Concern

This distinctive species has long leaves with spiny margins that closely resemble leaves of the yucca plant, from which it derives its Latin name. *Eryngium yuccifolium* is basically a species of prairie habitats, although substantial relict populations are still found on the coastal plain where prairie no longer occurs. The species is most abundant in the Midwest, and it reaches the northern limit of its range in the Minnesota River Valley. It was indeed a common and characteristic plant of the mesic prairies in southeastern Minnesota, but loss of habitat since the time of settlement has led to a 99% decline. The only populations surviving today occur in small, remnant habitats, mostly prairie strips on railroad rights-of-way. The Minnesota populations show no ability to adapt to human-created habitats and occur only in undisturbed native habitats. The species is particularly susceptible to cattle grazing and herbicide spraying. The decline is continuing and could threaten its survival in Minnesota within the next few years. **HABITAT**: *E. yuccifolium* occurs primarily in mesic prairies. It is frequently associated with other declining, prairie species such as *Asclepias sullivantii* (Sullivant's milkweed) and *Cacalia plantaginea* (tuberous Indian-plantain). **REFERENCES**: Trent, J. A. 1938. *Eryngium yuccifolium*: ecological distribution and some morphological irregularities. Transactions of the Kansas Academy of Science 41:155-61.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna*. Univeristy of Minnesota Press, Minneapolis for the Minnesota Dept. of Natural Resources.

LESPEDEZA LEPTOSTACHYA Engelm.

Fabaceae

Prairie Bush Clover **105**

OFFICIAL STATUS: State ~~Endangered~~ Threatened; Federally Threatened

BASIS FOR STATUS: At one time this distinctive prairie legume may have been abundant, but it is now one of the rarest plants in the Midwest and was recently listed as a federally threatened species. The reason for the decline is the extensive loss of prairie habitat since the time of settlement, which has caused numerous local extirpations and a severe contraction of range. The result is that there are only a handful of scattered populations isolated in remnant habitats. These remnants have persisted because they were too rocky or steep for agricultural use. However, recent advances in agricultural technology have made these marginal lands more economical to convert to cropland, so habitat losses will continue.

There are currently about 30 populations of *Lespedeza leptostachya* known to survive range-wide (nine in Minnesota), but several consist of fewer than 50 individuals and may not be viable. The last stronghold of this species (if one exists) may occur in the Des Moines River Valley in southwest Minnesota and adjacent Iowa. Several of the larger populations survive there. Unfortunately, there is little protected habitat and current land-use changes may affect the species. Prairie Bush Clover Scientific and Natural Area (Jackson County) is a notable exception. It contains the largest population currently known and is being managed specifically for the benefit of this species.

An anomalous population was discovered in the Gull Lake area of Cass County in 1890. The site has never been relocated, and it may no longer be possible to verify the record.

PREFERRED HABITAT: This species occurs in dry, gravelly hill prairies and in thin soil prairies over granite bedrock. It also shows a distinct preference for north-facing slopes. Commonly associated species include *Andropogon gerardi* (big bluestem) and *Sorghastrum nutans* (Indian grass).

AID TO IDENTIFICATION: This long-lived perennial is not a conspicuous plant, but it is quite distinct from all others that grow in Minnesota. The flowers are small, creamy white to purplish and are arranged in a slender, interrupted spike. The legumes are ovate and about the same length as the setaceous, pubescent calyx. The leaflets are linear or linear-oblong and pubescent. The only other species of *Lespedeza* native to Minnesota is *L. capitata*, which differs in having short, dense spikes and wider leaflets. When the two species grow together, hybrids frequently occur that are intermediate in spike length and leaflet width.

SELECTED REFERENCES: Clewell, A. F. 1966. Native North American species of *Lespedeza*. Rhodora 68:359-405; Sheldon, E. P. 1890. Some extensions of plant ranges. Minnesota Botanical Studies 1:14-18.

Lespedeza leptostachya: (a) entire plant, x 1/8; (b) portion of fruiting stem, x 2; c) portion of inflorescence, x 3.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna*. Univeristy of Minnesota Press, Minneapolis for the Minnesota Dept. of Natural Resources.

VALERIANA EDULIS Nutt. ssp. CILIATA (T.& G.) F. G. Mey

OFFICIAL STATUS: Threatened

SYNONYM: *Valeriana ciliata* T. & G.

BASIS FOR STATUS: This long-lived perennial was not formerly rare in Minnesota, but the nearly total destruction of prairie and fen habitats has reduced the species to a few isolated colonies. The situation is much the same throughout its range, especially in Iowa, Ohio, Michigan, Indiana, and Ontario.

In Minnesota it is currently experiencing a second and more threatening decline that could eliminate 80% of the remaining populations within the next ten years. The losses will be greatest among populations occurring in prairies on railroad rights-of-way. These prairie strips have long been unavailable for agriculture and have served as *de facto* sanctuaries for many native species. Recently, however, railroad companies have been abandoning many rail lines and selling the rights-of-way. These rights-of-way, and the prairies that occur on them, are typically bought by adjacent landowners and converted to crop production.

The large number of recent records for this species reflects an attempt by the Minnesota DNR to inventory these prairie strips before they are destroyed. A number of these recently discovered populations have already been lost, especially in Mower, Steele, and Waseca counties.

Comments: The typical subspecies of *Valeriana edulis* occurs in the mountainous regions of western North America, extending east as far as the Black Hills in South Dakota. According to Meyer, the two subspecies are separated geographically and ecologically, although morphologically they are barely separable. The accompanying map includes only the range of ssp. *ciliata*.

PREFERRED HABITAT: This species appears to require a moist, sunny, calcareous habitat. This includes fens, meadows, and mesic prairies. In these habitats, *V. edulis* is typically associated with other declining species such as *Asclepias sullivantii* (Sullivant's milkweed), *Cypripedium candidum* (small white lady's-slipper), and *Cacalia tuberosa* (tuberous Indian-plantain).

In the Paleozoic Plateau or "driftless area" of extreme southeastern Minnesota, the species occurs in thin soil on exposed limestone bluffs. This habitat superficially appears to be quite different from the more typical habitats, but it seems to provide the same requirements of moisture, sunlight, and pH.

AID TO IDENTIFICATION: *V. edulis* is the only indigenous member of this family in Minnesota and can be easily identified. The whitish flowers are dioecious (unisexual) with five petals, three stamens, and a three-lobed stigma. The sepals are modified into distinctive plumose bristles that are rolled up in flower but expand when the fruit matures. The inflorescence is a panicle with numerous lateral branches becoming diffuse with age. The thick, perennial roots are yellow and strong-scented. The leaves are thick, parallel-veined, and distinctively ciliate. The basal leaves are on short, winged petioles and are mostly entire with occasional basal lobes. The cauline leaves are smaller, in remote pairs, and pinnately divided.

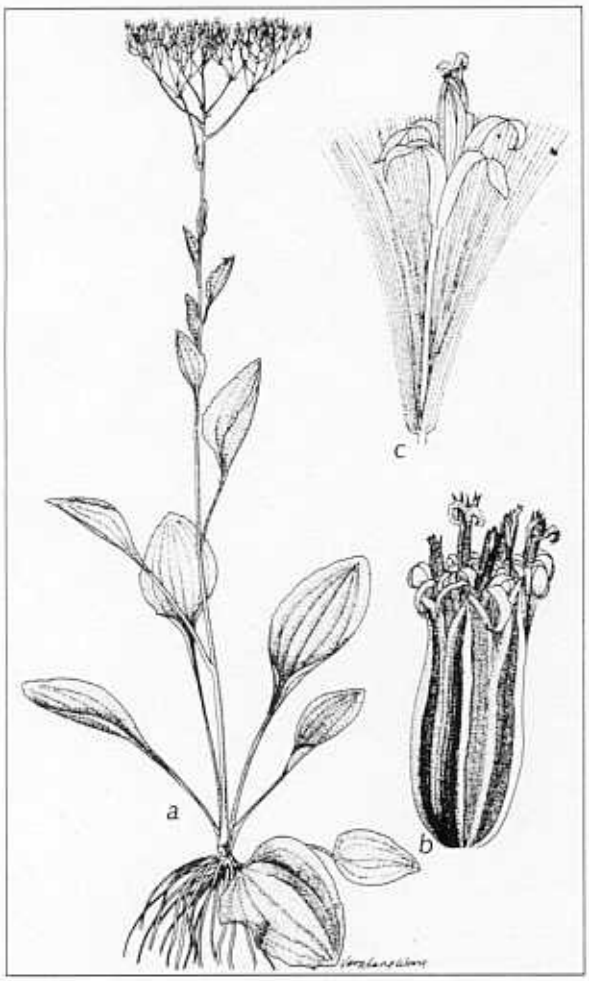
SELECTED REFERENCES: Meyer, F. G. 1951. *Valeriana* in North America and the West Indies (Valerianaceae). Annals of the Missouri Botanical Garden 38 (4): 377-503.

Valeriana edulis ssp. *ciliata*: (a) entire plant, x 1/5; (b) staminate flower, x 5; (c) fruit, x 5.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna*. University of Minnesota Press, Minneapolis for the Minnesota Dept. of Natural Resources.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna*.
University of Minnesota Press, Minneapolis for the Minnesota Dept. of Natural Resources.

CACALIA PLANTAGINEA (Raf.) Skinner



OFFICIAL STATUS: Threatened

SYNONYM: *Cacalia tuberosa* Nutt.

BASIS FOR STATUS: Historical records indicate that *Cacalia plantaginea* was not formerly rare in Minnesota but has suffered a recent decline paralleling the nearly total conversion of its prairie habitat. The once continuous population that apparently ranged throughout southern Minnesota has been reduced to a few remnant colonies. This pattern of habitat loss is repeated across the northern portion of its range and has caused concern for its survival in South Dakota, Minnesota, Iowa, Wisconsin, Michigan, Ohio, and Ontario. Compounding this problem are the natural demographics of the species. It normally occurs in very low densities. Consequently, the small remnant habitats that survive today have preserved few individuals and may be incapable of supporting viable populations.

Most of the surviving habitats are remnant prairie strips on railroad rights-of-way. For decades these prairies have been unavailable for agricultural use and flourished under benign neglect. Railroad companies have recently begun to abandon many rail lines and to sell the rights-of-way to adjacent landowners. Once sold, the rights-of-way are typically converted to crop production, which further reduces the habitat of *C. plantaginea*. The only populations of this species that are adequately protected in Minnesota occur in Wild Indigo Scientific and Natural Area (Mower County) and in Iron Horse Scientific and Natural Area (Dodge County). Both these sites are abandoned railroad rights-of-way preserved by the DNR for their indigenous prairie habitat and rare plant species.

Comments: The rate of railroad abandonment has accelerated in recent years, increasing the threat to this species. The only way to preserve this species in Minnesota may be to acquire additional abandoned railroad rights-of-way and manage them for the perpetuation of the native plant species.

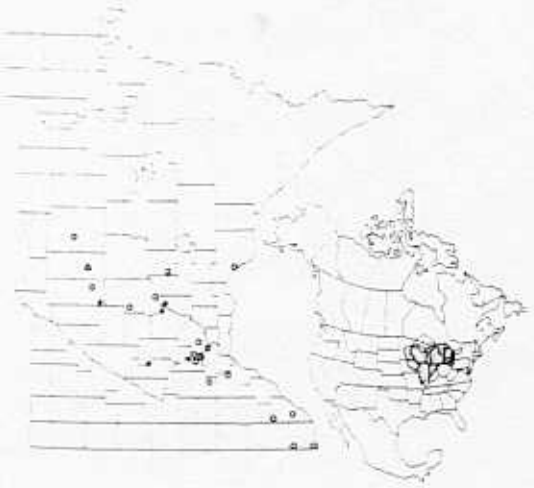
PREFERRED HABITAT: In Minnesota this species is restricted to native, mesic prairies in the southeastern portion of the state; the Minnesota River Valley appears to have functioned as an effective barrier to northward migration. The species seems to have little tolerance for disturbance and is not found in areas that have a history of cattle grazing, herbicide application, or repeated haying. *C. plantaginea* frequently occurs with other declining prairie species such as *Asclepias sullivantii* (Sullivant's milkweed) and *Parthenium integrifolium* (wild quinine).

AID TO IDENTIFICATION: Flowering individuals of *C. plantaginea* are quite distinctive. They possess a branched, flat-topped inflorescence that is whitish in appearance. The heads are typically five-flowered, and each flower is tubular and perfect. The involucre commonly has five phyllaries in a single row. The stem is angled and grooved. Sterile individuals can be identified by ovate or oval basal leaves that are long-petioled with five to seven nearly parallel veins.

SELECTED REFERENCES: Pippen, R. W. 1978. Compositae. North American Flora. Series 2, part 10. New York Botanical Garden.

Cacalia plantaginea: (a) entire plant, x 1/6; (b) flowering head, x 3 1/2; (c) flower, x 5.

CIRSIUM HILLII (Canby) Fern. Asteraceae
Hill's Thistle



OFFICIAL STATUS: Special Concern

This enigmatic species has been poorly understood for years. It is sometimes considered a subspecies of *Cirsium pumilum* (Nutt.) Spreng., which is a more easterly species. It is also closely related to (and often confused with) *C. drummondii* of the arid Great Plains. However, the midwestern populations, referred to *C. hillii*, appear to represent a distinct entity. There are numerous records of this species in Minnesota, but few are recent, indicating it is not nearly as common as it once was. This decline appears to be widespread and is causing concern for the survival of this species across most of its range. The decline is owing to a general loss of habitat resulting from the conversion of prairies to agricultural production. The Minnesota populations are largely restricted to habitats in the transition zone between the major forest and prairie biomes. This is a very unusual distribution, and there is no easy explanation for it. The populations are typically small and remote but are apparently stable where their habitat is protected. **HABITAT**: *C. hillii* typically prefers dry, sandy or gravelly soil in prairies, savannas, and open woods. **REFERENCES**: Moore, R. J., and C. Frankton. 1965. An evaluation of the status of *Cirsium pumilum* and *Cirsium hillii*. Canadian Journal of Botany 44:581-95.

CLADIUM MARISCOIDES (Muhl.) Torr. Cyperaceae
Twig-rush

OFFICIAL STATUS: Special Concern

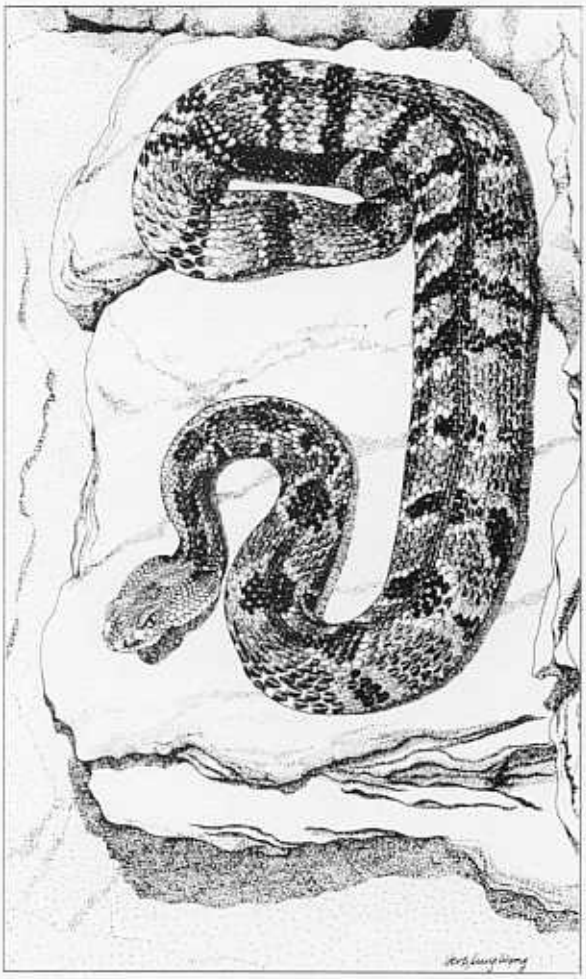
Cladium mariscoides is a wetland species of the Atlantic Coastal Plain and Great Lakes region. It has been known to occur in Minnesota since 1927, but it was thought to be extremely rare until just recently. In 1978 the DNR began a statewide biological inventory of peatlands and found several previously unknown populations. Most populations occur in relatively small microhabitats within large peatland complexes, but there are also relict populations isolated in the prairie region. In spite of the recent discoveries, the status of this species requires close monitoring. The known populations are small and vulnerable to habitat degradation. In particular, the prospect of large-scale peat mining for energy production poses a serious habitat-specific threat. Furthermore, outlying populations face threats from agriculture, mineral mining, and industrial development. However, there are major populations in the expansive Red Lake Peatland and Myrtle Lake Peatland that appear to be secure for the immediate future. **HABITAT**: *C. mariscoides* typically occurs in patterned water tracks (ribbed fens), spring fens, and calcareous fens. These are open, sunny, wet habitats generally dominated by sedges. The populations in Pine and Lake counties are reportedly from lakeshores. **REFERENCES**: Wheeler, G. A., and P. H. Glaser. 1979. Notable vascular plants of the Red Lake Peatland, northern Minnesota. The Michigan Botanist 18:137-42.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna*.
University of Minnesota Press, Minneapolis for the Minnesota Dept. of Natural Resources.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna.* Univeristy of Minnesota Press, Minneapolis for the Minnesota Dept. of Natural Resources.

TIMBER RATTLESNAKE

346 *Crotalus horridus* Linnaeus



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Timber Rattlesnake

OFFICIAL STATUS: ~~Special Concern~~ Threatened

BASIS FOR STATUS: The timber rattlesnake is restricted primarily to the east-central United States and portions of southern New England. On the northwestern periphery of its range, a small finger extends northward along the Mississippi River into northeastern Iowa, southeastern Minnesota, and southwestern Wisconsin. It is declining in some areas throughout its range and is now extirpated from many sites in the eastern United States and southern Canada. In Minnesota the rattler is restricted entirely to eight southeastern and east-central counties that border the Mississippi River and its tributaries. Even within this limited range, it has a spotty and localized distribution; at some localities it appears to be common and abundant whereas elsewhere it is declining.

The major cause of the timber rattlesnake's demise is the species' vulnerability to systematic and willful destruction by humans. It is currently bountied in Houston, Winona, Wabasha, and Fillmore counties. In 1982 alone, park naturalist Dave Palmquist (unpublished observations) reported that over $3000 was paid on rattlesnakes in Houston County, with a payment of approximately $1 per snake. The continued unprotected status of the timber rattlesnake may contribute to significant destruction of other snake species, including the massasauga and nonpoisonous snakes. Fear of rattlesnakes often results in indiscriminate killing of other large snakes. Furthermore, timber rattlesnakes have been found overwintering at denning sites with several other species; such sites, which are essential for the overwintering survival of the species, are particularly vulnerable to bounty hunters.

PREFERRED HABITAT: During the summer months, the species inhabits deciduous forests, croplands, and bottomlands along river valleys. In the spring and fall, Breckenridge (1944) and Vogt (1981) have found timber rattlesnakes frequenting steep, rugged bluffs, rock ledges, and outcrops near overwinter dens.

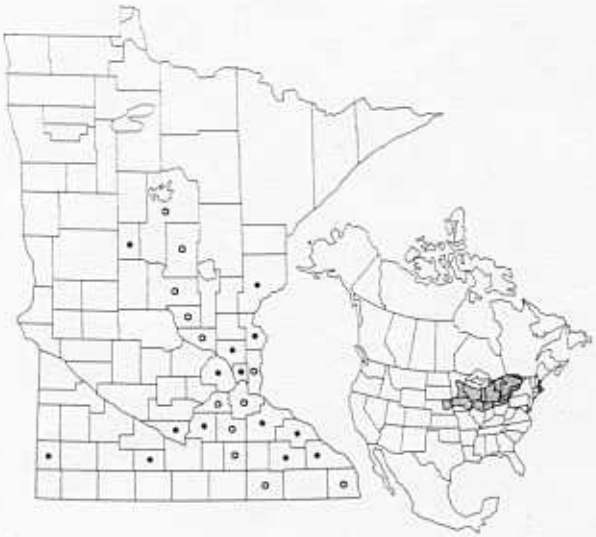
AID TO IDENTIFICATION: The timber rattlesnake is a large snake, averaging between 90 and 140 centimeters in length. It has a distinctive banded body pattern. The light, solid background (which becomes darker toward the tail) is variably colored, anywhere from a yellowish to a dark brown. Often referred to as the banded rattlesnake, large, dark bands are found along its back, becoming incomplete and/or broken toward the head. On some specimens there are dark bars stretching from the eye to the mouth, but on others this is indistinct or missing. Scales on the upper side have distinct ridges (keels). The species is one of only two venomous snakes in Minnesota. Its most distinctive characteristic is the tan-colored rattle at the base of its tail, a trait shared by Minnesota's second venomous snake, the eastern massasauga. The latter species, however, lacks the banded pattern of the timber rattlesnake.

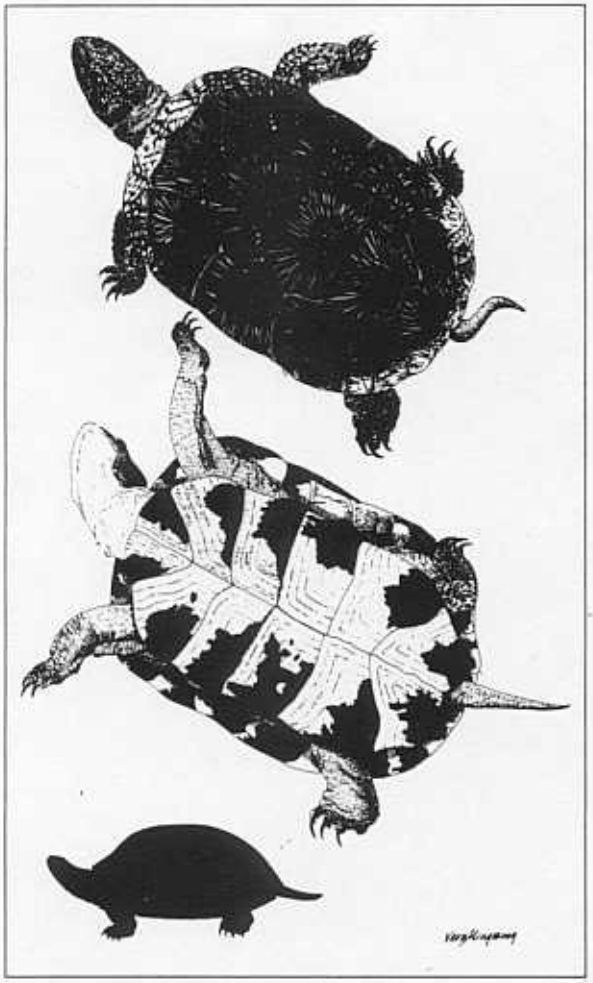
RECOMMENDATIONS: To help protect the timber rattlesnake from systematic destruction or collection, all county bounties and similar incentives should be prohibited. Additional information on the nature and extent of organized efforts to destroy rattlesnakes and on the impact of these activities on rattlesnakes and other species, particularly other large snakes, should be gathered. Efforts should be made to preserve river bottomland habitats and den sites.

SELECTED REFERENCES: Breckenridge 1944; Brown 1982; Brown et al. 1982; Collins and Knight 1980; Conant 1975; Keenlyne 1972; Vogt 1981.

BLANDING'S TURTLE

332 *Emydoidea blandingii* (Holbrook)





Blanding's Turtle: adult viewed from above (top) and below (bottom); side view shown in silhouette.

OFFICIAL STATUS: Threatened

BASIS FOR STATUS: Although formerly more widespread, the Blanding's turtle is now restricted to a small number of states and provinces in the Upper Midwest, stretching from Nebraska eastward to Michigan, Ontario, and Quebec. A smaller remnant population, spanning portions of a few New England states, as well as a number of scattered populations throughout the Northeast, testify to the turtle's more expanded range in earlier times. Minnesota lies on the northwest periphery of the species' range. An extensive area of sand dunes and marshes along the Mississippi River, south of the town of Kellogg, is recognized as a major concentration area for the turtle and may be one of the largest breeding populations in its entire range. Elsewhere in the state, the Blanding's turtle has a more spotty distribution, following the Mississippi and St. Croix rivers northward into east-central Minnesota and the Minnesota River westward into the south-central portions of the state. Two recent records from Pipestone County also confirm the species' presence in the Missouri River drainage of extreme southwestern Minnesota.

As a marsh inhabitant the recent destruction of wetland habitats by drainage and/or inundation for agricultural purposes, river channelization, and water impoundment has greatly decreased available habitat for the species. Like other turtles, the Blanding's turtle is also vulnerable to collecting as a desirable pet species ($45 for a 15 to 20 centimeter turtle); it is easily collected in areas where it is abundant, especially during the nesting season. The species' life history also makes this turtle particularly susceptible to human disturbances, as evidenced by a long term and intensive study of the population inhabiting the Kellogg Dunes (Pappas, personal communication). Some features contributing to this susceptibility are late maturation, low reproductive potential (one clutch/season), long-lived adults, and high mortality of eggs and juveniles. Population and reproductive dynamics suggest viable populations of Blanding's turtles are dependent on large numbers of animals and adequate areas of undisturbed habitat.

PREFERRED HABITAT: The preferred habitat of the Blanding's turtle includes calm, shallow water, rich, aquatic vegetation and sandy uplands for nesting. Studies by Congdon et al. (1983) in Michigan and by Linck (personal communication) in Massachusetts have shown that nesting females may travel considerable distances (200 to 400 meters) to a nesting area, passing enroute what appears to be suitable nesting habitat immediately adjacent to the marsh in which they reside.

AID TO IDENTIFICATION: Blanding's turtle is medium-sized, averaging 15 to 25 centimeters in length. The species' most diagnostic field characteristics are its smooth, domed upper shell, or carapace, and its bright yellow neck, throat, and chin. The carapace usually appears bluish black, with numerous specks of yellow throughout. The lower shell, or plastron, is bright yellow with black patches on the outside margin. In general, the adult male can be distinguished from the female by its slightly indented plastron and longer tail. The most distinct feature of the plastron is the hinge, which allows the turtle to raise the plastron upward and provide more protection to the soft extremities that it has pulled inside the shell. For this reason the species is often referred to as a "semibox" turtle.

RECOMMENDATIONS: Efforts to identify, protect, and preserve preferred habitats of this species should be continued, particularly where populations are locally abundant. Additional information on the species' local distribution and abundance should also be collected to allow an accurate assessment of its current status and to aid in protection efforts.

SELECTED REFERENCES: Breckenridge 1944; Conant 1975; Congdon et al. 1983; Ewert 1982; Graham and Doyle 1977; McCoy 1973; Vogt 1981.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna*. Univeristy of Minnesota Press, Minneapolis for the Minnesota Dept. of Natural Resources.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

JUL 24 2003

Ms. Leslie H. Knapp
Senior Consultant
Earth Tech
Suite 175
3033 Campus Drive North
Minneapolis, Minnesota 55441

Dear Ms. Knapp:

This responds to your letter dated July 15, 2003, requesting information on threatened and endangered species for the Rochester Water Reclamation Plant Expansion in Olmsted County, Minnesota.

The bald eagle (*Haliaeetus leucocephalus*), Leedy's roseroot (*Sedum integrifolium spp. leedyi*), and prairie bush clover (*Lespedeza leptostachya*), are listed as federally threatened in Minnesota and documented to occur in Olmsted County. The prairie bush clover has been found at two locations within the project area identified in your above referenced letter (T108N, R14W, NENE28; SWNESW22). In accordance with Section 7(c) of the Endangered Species Act of 1973, as amended, it is the responsibility of the Federal agency to determine if its actions "may affect" listed species or critical habitat. We recommend that your assessment of project effects on federally-listed species be included in any environmental documentation required for the proposed project.

We appreciate the opportunity to comment and look forward to working with you in the future. If you have questions regarding our comments, please call Mr. Gary Wege of my staff at (612) 725-3548, extension 207.

Sincerely,

Dan P. Stinnett
Field Supervisor

MINNESOTA HISTORICAL SOCIETY

August 15, 2003

Ms. Leslie Knapp
Earth Tech
3033 Campus Drive North, Suite 175
Minneapolis, MN 55441

Re: Rochester Water Reclamation Plant Expansion – Trunk Sewer Extension
Olmsted County
SHPO Number: 2003-3185

Dear Ms. Knapp:

Thank you for the opportunity to review and comment on the above project. It has been reviewed pursuant to the responsibilities given the Minnesota Historical Society by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

Your review submittal indicates that you are currently completing a preliminary cultural resources review of the project area, to identify previously identified sites and to devise an appropriate survey strategy. We look forward to reviewing the results of this study and to working with you during the planning process for this project.

Contact us at 651-296-5462 with questions or concerns.

Sincerely,

Kelly Gragg-Johnson

Dennis A. Gimmestad
Government Programs & Compliance Officer

cc: Anne Ketz, The 106 Group